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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,389	02/10/2004	Toshiya Uemura	PTGF-03083	9738

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EXAMINER

LOUIE, WAI SING

ART UNIT PAPER NUMBER

2814

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/774,389

Applicant(s)

UEMURA, TOSHIYA

Examiner

Wai-Sing Louie

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4-5, 7, and 10-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Slater et al. (US 6,791,119).

With regard to claim 1, Slater et al. disclose a light-emitting diode (col. 6, line 51 to col. 23, line 14 and fig. 2) comprising:

- a semiconductor light-emitting element 100 (fig. 1) that radiates light from a light-emission surface provided on a side opposite to an electrode forming surface of the light-emitting element 100 (fig. 2);
- lead frames that are electrically connected to electrodes formed on the electrode forming surface through wires 260 and 270 (fig. 2);
- a transparent structure 730 that is optically connected with the light-emission surface and has a light distribution characteristic (col. 7, lines 4-13) based on its three-dimensional shape 730 (col. 12, lines 53-65 and fig. 7b), the transparent structure being mounted on a substrate 710 positioned on a side opposite the light-emitting element 740 (fig. 7b); and

- light transmitting plastic (resin) that seals the semiconductor light-emitting element 100 and the transparent structure 110 (col. 11, lines 4-11 and fig. 2).

With regard to claim 4, Slater et al. disclose the transparent structure 110 has a microscopic uneven surface to diffuse light (col. 15, lines 34-45 and fig. 9).

With regard to claim 5, Slater et al. disclose the transparent structure 1310 has a reflection layer 1732 formed on its surface (fig. 17a).

With regard to claim 7, Slater et al. disclose the electrodes 150 and 160 are metallic and reflective (col. 7, line 66 to col. 8, line 3). Inherently, the electrodes do not transmit light.

With regard to claims 10-11, Slater et al. disclose a substrate 110, a buffer layer (col. 7, lines 45-48), an n-type semiconductor layer 120, an intrinsic GaN light-emitting layer 130 (col. 7, line 55), and a p-type semiconductor layer 140 (col. 7, lines 33-45 and fig. 1).

With regard to claim 12, Slater et al. disclose the a transparent structure 730 is SiC (col. 12, line 49).

With regard to claim 13, Slater et al. disclose the substrate 110 comprises sapphire (col. 7, line 17).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Slater et al. (US 6,791,119) in view of Lin et al. (US 6,614,058).

With regard to claim 2, Slater et al. do not disclose the transparent structure 110 has a length in the horizontal direction greater than that of the semiconductor light-emitting element 100. However, Lin et al. disclose the substrate 403 has a length in the horizontal direction greater than that of the semiconductor light-emitting element 405 (Lin fig. 5). Lin et al. teach the lengthened substrate 403 creates an incline sidewall, which reflects the light emitted from the light-emitting element and reduces energy loss (Lin col. 5, lines 59-67). Slater et al. and Lin et al. have substantially the same environment of LED having a SiC substrate (Lin col. 3, lines 38-40). Therefore, it would have been obvious for the one with ordinary skill in the art to modify Slater's device with the teaching of Lin et al. to provide a longer transparent structure in order to reflect the light-emission and reduce energy loss.

With regard to claim 3, Slater et al. do not disclose the transparent structure 110 has a thickness of half that of the semiconductor light-emitting element to twice the length of a shorter side of the semiconductor light-emitting element. Since the applicant has not established the criticality of the thickness stated and since these thickness are in common use in similar devices in the art, it would have been obvious to one of ordinary skill in the art to use these values in the device. Where patentability is said to be based upon particular chosen dimension or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

With regard to claims 14-15, Slater et al. do not disclose an adhesive is used to connect the transparent structure to the light-emitting structure. However, it is common in the art to use adhesive to connect two structures together such as disclosed in Lin et al. (adhesive layer 415 see col. 3, lines 52-54). Lin et al. teach the adhesive can facilitate the alignment of the light-emitting structure (Lin col. 3, lines 54-56). Thus, it would have been obvious at the time the invention was made to modify Slater's device with the teaching of Lin et al. to use adhesive is used to connect the transparent structure to the light-emitting structure in order to aid the alignment of the light-emitting structure. Although, Slater et al. modified by Lin et al. do not specifically state the adhesive is transparent. However, since Slater et al. and Lin et al. select the transparent substrate, transparent light-emitting structure, and transparent electrode for the device, it is clear that the adhesive layer needed to be transparent so that this layer will not absorb or obstruct the light emitted by the device. Thus, it would have been obvious to one with ordinary skill in the art to use transparent adhesive to connect the transparent structure to the light-emitting structure.

With regard to claim 16, in addition to the limitations disclosed in claim 1 above, Slater et al. modified by Lin et al. also disclose:

- the transparent structure 403 has a length in the horizontal direction greater than that of the semiconductor light-emitting element 405 (Lin fig. 5).

Claims 6 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Slater et al. (US 6,791,119) in view of Lowery et al. (US 6,351,069).

With regard to claim 6, Slater et al. do not disclose one of the lead frame has a cup portion. However, Lowery et al. disclose a LED 34 is positioned on the reflector cup lead frame

14 (Lowery fig. 3). Lowery et al. teach the reflector cup lead frame propagating output light in the general direction of the arrow 26 (Lowery col. 5, lines 54-56 and fig. 3). Slater et al. and Lowery et al. have substantially the same environment of a LED encapsulated in a lead frame. Therefore, it would have been obvious at the time the invention was made to modify Slater's device with the teaching of Lowery et al. to provide a cup lead frame in order to propagate output light in the general direction. Slater et al. modified by Lowery et al. disclose the LED is fixed on the cup portion 14 through adhesive resin 38 with phosphor (light diffusion material) mixed (Lowery col. 6, lines 64-67).

With regard to claim 8, in addition to the limitations disclosed in claim 1 above, Slater et al. modified by Lowery et al. also disclose:

- the light transmitting resin including a phosphor to wavelength-convert light emitted from the semiconductor light-emitting element (Lowery col. 6, lines 64-67).

With regard to claim 9, Slater et al. modified by Lowery et al. the light transmitting resin contains two kinds of phosphor (Lowery col. 5, lines 5-7).

Response to Arguments

Applicant's arguments filed 4/25/05 have been fully considered but they are not persuasive.

- applicant argues that Slater et al. do not disclose "a transparent structure that is optically connected with the light emission surface and has a light distribution

characteristic based on its three-dimensional shape”. However, Slater et al.

disclose such a structure. Please see fig. 7B and the rejection of claim 1 above.

- Applicant argues that Slater et al. do not disclose “a semiconductor light-emitting element that radiates light from a light emission surface provided on a substrate opposite an electrode forming surface”. However, Slater et al. disclose such a structure. Please see fig. 1 and the rejection of claim 1 above.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (571) 272-1709. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wsl
July 1, 2005.


LONG PHAM
PRIMARY EXAMINER